

CLAIMS

1. A standardised modular system (100) for moulds of injection moulding machines comprising:

- an injection assembly (1) provided with a plurality of injectors (14) for injection of plastic material into the mould,
- an ejection assembly (5) provided with a plurality of ejectors (68, 69) for ejection of the moulded item (90) from the mould, and
- a mould (2) comprising a fixed mould half (3) associated with said injection assembly (1) and a movable mould half (4) associated with said ejection assembly (5) and movable from a mould closed position wherein the plastic material is injected into the mould to a mould open position wherein the item formed by the mould is ejected, characterised in that it further comprises:
 - female mould inserts (32) and male mould inserts (42) removably mounted in special seats formed respectively in a female mould plate (30) of the fixed mould half and in a male mould plate (40) of the movable mould half so as to be modularly composable and decomposable, according to the item to be moulded,
 - first adapter means (8) disposed, interchangeably, between said injection assembly (1) and said fixed mould half (3) so as to allow the arrangement of said injectors (14) of said injection assembly to be varied, and
 - second adapter means (56, 66, 67, 83) disposed, interchangeably, between said ejection assembly (5) and said movable mould half (4) so as to allow the arrangement of said ejectors (68, 69) of the ejector assembly to be varied.

2. A standardised modular system (100) according to claim 1, characterised in that said first and second adapter means comprise first and second heat-regulating inserts (8, 83) removably mounted in special seats formed respectively in said female mould plate (30), on the surface facing towards the injection assembly (1), and in said male mould plate (40), on the surface facing towards the ejection assembly (5), said heat-regulating inserts (8, 83) being able to regulate the temperature of the moulded item (90) inside the mould.

3. A standardised modular system (100) according to claim 2, characterised in that

- said first heat-regulating inserts (8) comprise a plurality of through holes (83) aligned with the through holes (33) of said female mould inserts (32) of the fixed

mould half, to allow the passage of the nozzles of the injectors (14) in said female mould inserts (32), and

- said second heat-regulating inserts (83) comprise a plurality of through holes disposed in register with through holes of said male mould inserts (42) of the movable mould half, to allow the passage of the ejectors (68, 69) in said male mould inserts (42).

4. A standardised modular system (100) according to any one of the preceding claims, characterised in that said second adapter means further comprise at least one group of ejector plates (56, 66, 67) removably mounted in a base plate (50) of said ejector assembly, said plates (56, 66, 67) being provided with a plurality of holes to retain and/or guide said ejectors (68, 69).

5. A standardised modular system (100) according to claim 4, characterised in that it comprises:

- a first group of ejector plates (56) made integral with said base plate (50) of the ejector by means of a first table (58) fixed to said base plate (50),
- a second and third group of ejector plates (66, 67) packed together by means of a second and third table (62, 63) fixed to each other, and
- actuator means (51, 52, 53) connected to said second and third table (62, 63) to move them toward and away from said core plate (40) of the movable mould half.

6. A standardised modular system (100) according to claim 5, characterised in that said actuator means comprise a pneumatic cylinder (51) mounted in said base plate (50) of the ejector assembly and a piston having a plunger (52) disposed in said pneumatic cylinder (51) and a shaft connected to said second and third table (62, 63).

7. A standardised modular system (100) according to claim 5 or 6, characterised in that said ejectors of the ejector assembly comprise punch ejectors (68) and/or telescopic ejectors (69), the base of each ejector being blocked between said second and third group of ejector plates (66, 67), each telescopic ejector comprising a sleeve (69) hollow on the inside telescopically guided on a guide shaft (57), the base whereof being fixed to said first group of ejector plates (56).

8. A standardised modular system (100) according to any one of claims 5 to 7, characterised in that said second and third table (62, 63) are guided in their movement

towards and away from the male mould plate (40) of the movable mould half by means of four tiebars (61) disposed near the four corners of the second and third table (62, 63), each tiebar (61) having one end guided by a bush (60) integral with the base plate (50) of the ejector assembly and the other end guided by another bush (49) integral with the male mould plate (40) of the movable mould.

9. A standardised modular system (100) according to any one of the preceding claims, characterised in that it comprises:

- a plurality of slides (20) mounted to slide sideways on said male mould plate (40) of the movable mould half, said slides comprising slots (26) able to be engaged by respective oblique tiebars (36) mounted on the side of said cavity plate (30) of the fixed mould half, so that on closure of the mould said slides (20) slide inwards, abutting against said male and female mould inserts (42, 32) and on opening of the mould said slides (20) slide outward moving away from said male mould inserts (42) to allow ejection of the moulded item, and
- a plurality of connecting elements (21) to connect said slides (20) to said male mould inserts (42), said connecting elements (21) being removably mounted in said slides (20) to be able to be interchangeable according to the type of male mould insert (42) used.

10. A standardised modular system (100) according to any one of the preceding claims, characterised in that said injectors (16) of the injection assembly comprise shutter injectors for aesthetic injection.